

Work Order ID 60817

Friday, July 23, 2010 10:25:38 AM

Page 1

Item ID: D350-748-101

Accept

Revision ID:

Item Name: Crosstube Installation, High Fwd

Start Date: 7/23/2010 Start Qty: 1.00

Required Date: 8/16/2010 Req'd Qty: 1.00




Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: *[Signature]* Date: 10-7-23 Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start 
Stop 

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D350-748-141	Rev E								
100		0.00							
	DOCUMENT CONTROL								
DC	Memo	0.00							
Document Control	Photocopy bluefile & type labels per PPPD350-748-101		CHG001						
110		0.00							
	BENDING MACHINE - CROSSTUBES								
CNC Bend 1	Memo	0.00							
CNC Delta 100 Bender	Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT _____								
120		0.00							
	QC15- Crosstube Dimensional Check								
QC	Memo	0.00							
Quality Control									

u
Scrp

[Signature]

10-8-18

Pho →

W/O: 60817		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
		Perm. Change.					
10/06/20	115.	Stress Relief (steel) cross tubes per ASZ 010			1		S 10/06/20
		Stress Relief steel cross tube per ASZ 010 # temp _____ Start time _____					S 10/06/20

Part No: D350-748-101 PAR #: N/P Fault Category: close to be NCR: Yes No DQA: 15 Date: 10.10.28
 Resolution: Rework Disposition: Rework QA: N/C Closed: 10/10/28

NCR: 60817		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10.08.20	110	Tube bent high on one side	CP 10.08.20 051042	CUT 1/8" FROM CUFF ON HIGH SIDE	 10-8-23	BE 10-08-23	CP 10.08.20 051042	S 10/10/20

NOTE: Date & initial all entries



- 4.2.3.12 Slide mandrel on top of both V-blocks and through bracket.
- 4.2.3.13 Tighten both nuts in an equal manner so that there is no play/movement in the mandrel.
- 4.2.3.14 Place buggy in proper orientation per bender folio.

REFERENCE ONLY

4.3 CROSSTUBE STRESS RELIEF (STEEL)

- 4.3.1 Stress relief shall be performed as soon as possible after bending:
 - 4.3.1.1 Place Crosstubes in the oven vertically (as installed on the aircraft)
 - 4.3.1.2 Heat crosstubes at 375 deg F for 4 hours
 - 4.3.1.3 Allow to cool at room temperature

4.4 DT8577A TABLE SETUP FOR ASSEMBLY

- 4.4.1 Remove all bolts (2 per support) in both support stands.
- 4.4.2 Remove both support stands from previous location and place in proper hole location using the hole location chart for DT8577A.
- 4.4.3 Ensure cuff supports provide stability for crosstube during assembly in proper hole location.
- 4.4.4 Tighten all bolts (2 per support).
- 4.4.5 Make sure that painted supports are used for Support/Abrasion Strip installation.
- 4.4.6 Use proper support locating jigs for correct crosstubes. Check with blueprints for correct angles needed.
- 4.4.7 Use correct Abrasion strip locating tools for correct crosstubes.

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Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130  Crosstubes	Crosstubes	0.00							
	Memo	0.00							
	1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-141								
	4-Remove all marks from tube within limits of D350-748-141								
	5- Apply a light coat of LPS3 on the interior of tube Batch: <u>M109956</u>								
140  QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo	0.00							
	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

10-8-23

10-8-24

S 10/08/24

FO

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150  Outsource3	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							
Outsource process - Cad plate	Memo Issue P/O: <u>12444</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached	0.00							<u>CZ 10/8/25</u> <u>(1)</u>
160  Packaging	Receive & Inspect for Damage & Mat'l Certs	0.00							
Packaging	Memo Ensure certificate of conformity is attached	0.00							<u>10/7/7</u> <u>(2)</u>
170  QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo	0.00							

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Dart Aerospace Ltd

W/O: 60817		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
10/9/14	175	WDT per QSF 038 before + after load testing per eng. this time only P/O: 12557	CY	10/9/14	①	10/9/14	
		rec'd + inspect		10/9/14	①		

Part No: D350-748-101 PAR #: CR10-23 Fault Category: Crosscube NCR: (Yes) No DQA: LA Date: 10.10.28
 Resolution: Scrap Disposition: Scrap QA: N/C Closed: LA Date: 10/10/28

NCR: 60817		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10/09/24	180	Pit marks found while trimming	10.10.26	Scrap (eng use only)	10/10/26	10/10/26	10/10/26	8 10/10/26

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Required Date: 8/16/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 	SprayPaint	0.00							
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Prime Outside of Tube as per Dart QSI 005 4.2								
190 	QC14- Inspect Spray Paint	0.00							
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								
200 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS								

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Cust Item ID:

Required Date: 8/16/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 	QC5- Inspect part completeness to step on W/O	0.00							
QC Quality Control	Memo	0.00							
220 	Pick Kit	0.00							
Packaging Packaging	Memo	0.00							
230 	QC4- 100% Inspect kits for completeness	0.00							
QC Quality Control	Memo	0.00							

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Required Date: 8/16/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101 Location: _____ PPP Rev: _____								
250		0.00							
	QC21- Final Inspection - Work Order Release								
QC	Memo	0.00							
Quality Control									

U 10.10.26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

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Work Order ID: 60817

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd


Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-141TRN 		Manufactured	No			110	Each	1.0000	1	1			
Crosstube Turning Detail													
					<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>						
					LG	55295	B59328 ①						
ALS4-1032-225 		Purchased	No			200	Each	6,043.000	1	1			
Insert													
					<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>						
					PK011	6043							
					110768	6043							
AN960JD10 	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1			
Washer													
D2856-400 		Manufactured	No			200	f	361.0188	1.181	1.243158			
Abraison Strip													
					<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>						
					ST403	361.0188421							
					56626	145.018842							
					59920	216							

DP 10-8-18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID: 60817

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Parent Item Name: Crosstube Installation, High Fwd

Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

D3502-1 Manufactured No

200

Each

56.0000

2

2



Support



Location

Loc Qty

Loc Code

ST066

56

47120

1

50287

38

52903

17

MS21920-20 Purchased No

200

Each

103.0000

2

2



Clamp (per MIL-DTL-8783C)



Location

Loc Qty

Loc Code

LG

103

112624

18

114687

35

114779

24

115057

26

MS27039-1-10 Purchased No

200

Each

133.0000

1

1



Screw



Location

Loc Qty

Loc Code

ST291

133

112794

33

112940

100

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID: 60817

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Parent Item Name: Crosstube Installation, High Fwd

Start Date: 7/23/2010

Required Date: 8/16/2010



Start Qty: 1.00

Required Qty: 1.00

AN4-41A	Purchased	No	220	Each	290.0000	8	8
							
Bolt							



<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

ST360	290	
111424	4	
113359	86	
114941	100	
115108	100	

AN4-6A	Purchased	No	220	Each	1,243.000	16	16
							
Bolt							

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

ST356	1243	
112933	96	
113149	344	
114523	2	
114615	1	
114941	500	
115108	300	

AN5-32A	Purchased	No	220	Each	228.0000	4	4
							
Bolt							

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

ST340	228	
113121	4	
114056	74	
114405	50	
115016	50	
115108	50	

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Shop Packet Print

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Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD416 NAS1149D0463J Purchased No

220

Each

0.0000

32

32



Washer

AN960JD516 NAS1149D0563J Purchased No

220

Each

0.0000

8

8



Washer

D3500-1 Manufactured No

220

Each

42.0000

4

4



Saddle

Location

Loc Qty

Loc Code

ST424

26

59120

8

59422

18

ST425

16

55605

16

D3501-1 Manufactured No

220

Each

406.0000

16

16



Bushing

Location

Loc Qty

Loc Code

ST066

406

45402

15

45918

112

48268

179

53779

100.

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Shop Packet Print

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Dart Aerospace Ltd

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Start Date: 7/23/2010

Required Date: 8/16/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

3,897.000

24

24



Nut

Location

Loc Qty

Loc Code

ST300

3897

113422

68

114523

28

114718

23

114784

1778

115108

2000

MS21042L5

Purchased

No

220

Each

796.0000

4

4



Nut

Location

Loc Qty

Loc Code

ST139

296

114813

296

ST300

500

115156

500

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

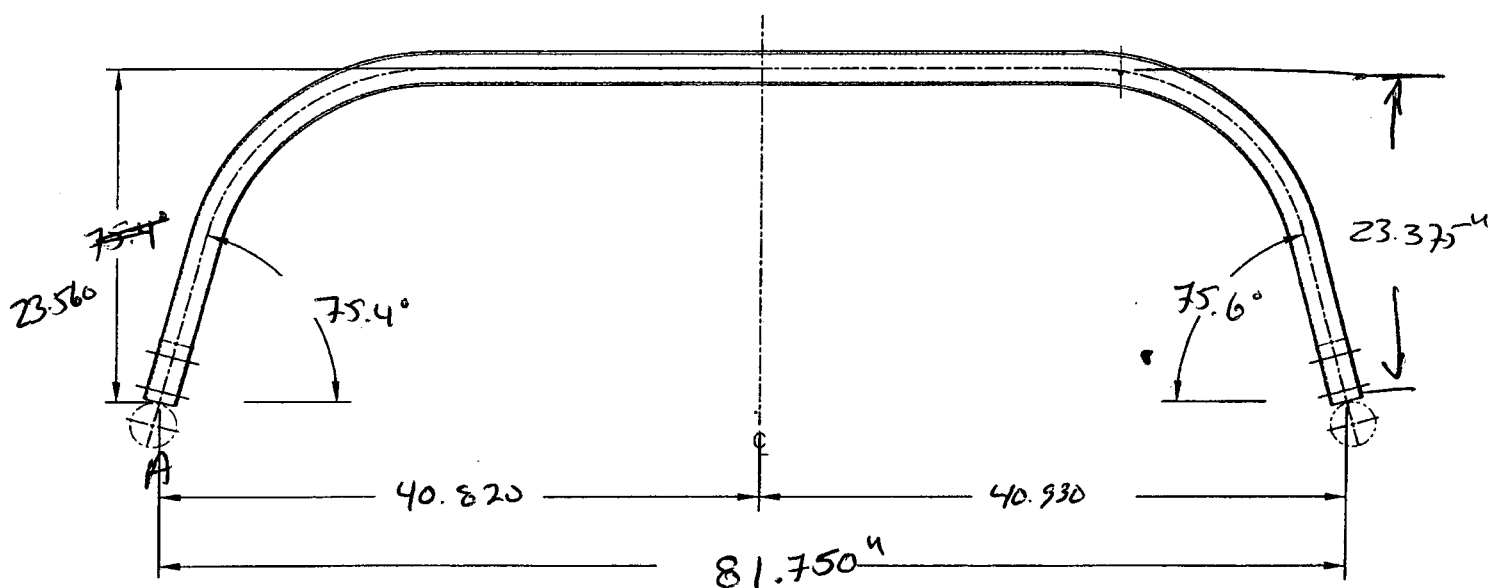
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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	60817
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141		Rev: D E	Page 1 of 1

10.08.18

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
twist = 0.116"
Cut 1/8" FROM HIGHT SIDE OF 10.08.20

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	<i>[Signature]</i>

Dart Aerospace Ltd

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NOTE: Date & initial all entries

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6017-115	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *60817*

BS10-7-23

RELEASED
R 2009-10-29
JB

E	REVISE GENERAL NOTES: UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>Q</i>	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>Q</i>	DRAWING NO.	REV. E
MFG. APPR.	<i>Q</i>	D350-748-141	SHEET 1 OF 4
APPROVED	<i>Q</i>	TITLE	SCALE
DE APPR.	<i>Q</i>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

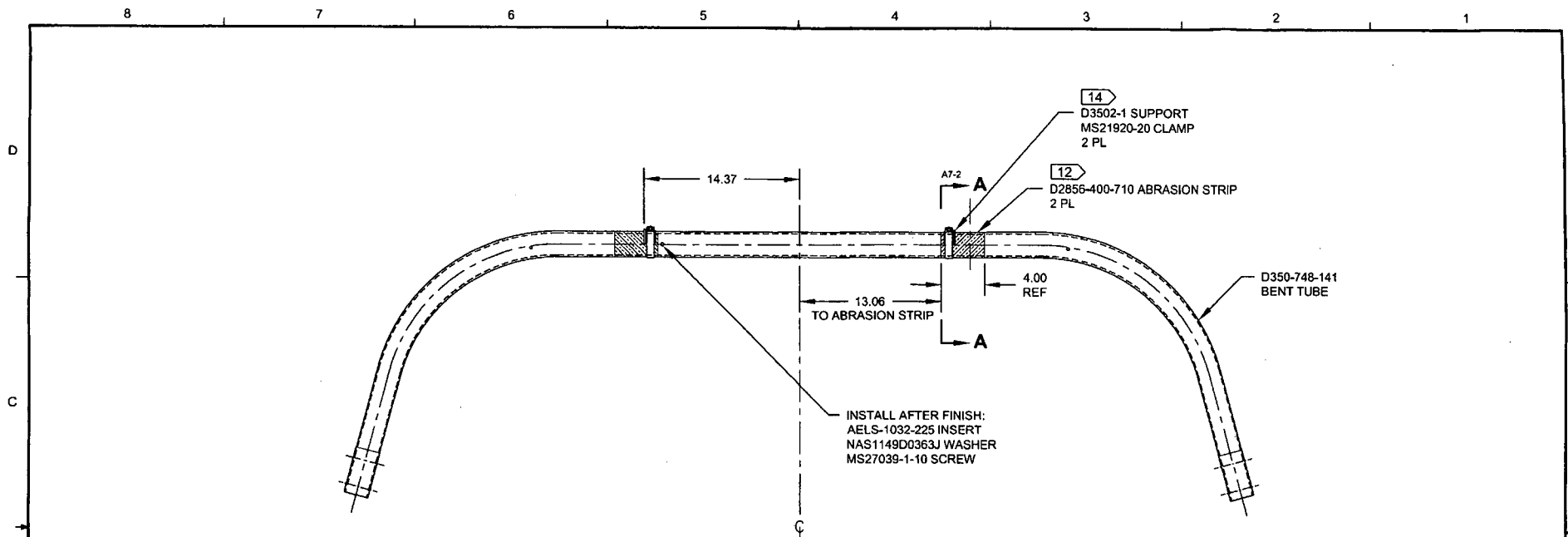
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

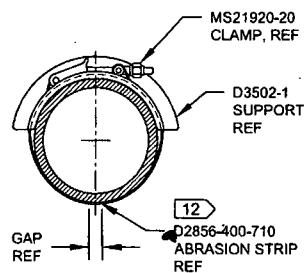
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



**D350-748-141
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

w/o 60817

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2009-10-29

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. E
MFG. APPR.	RF	D350-748-141	SHEET 2 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (AS 350/355 HI FWD)	NTS
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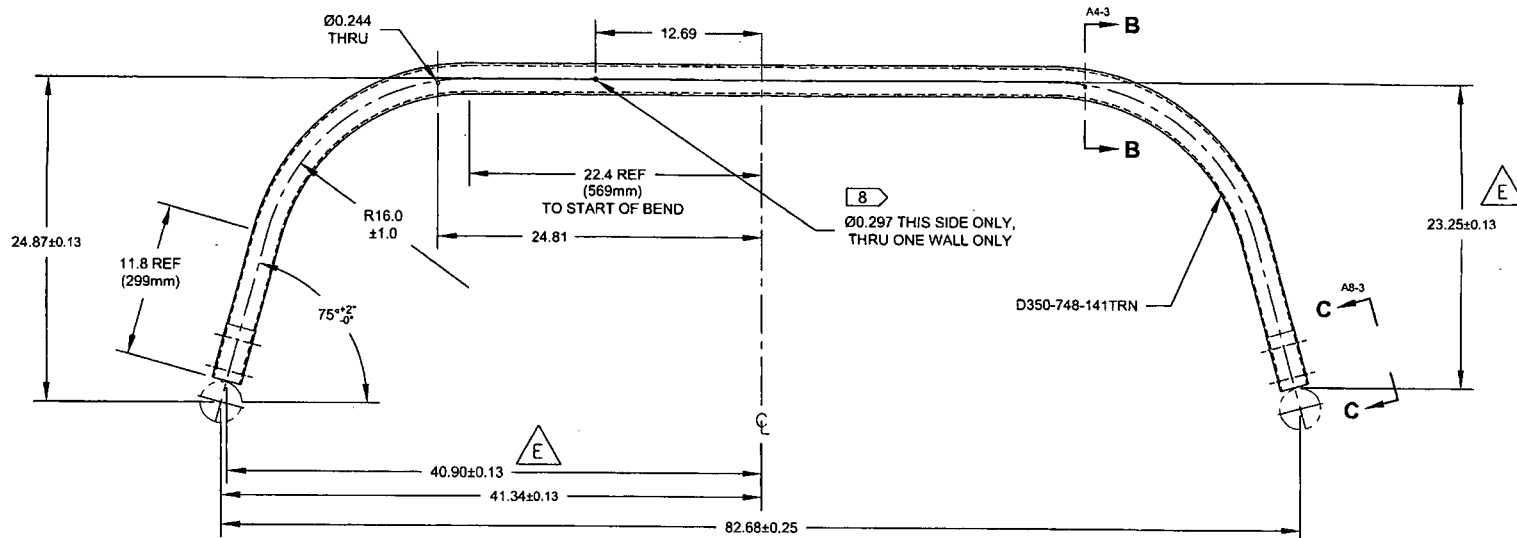
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

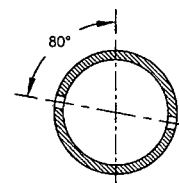
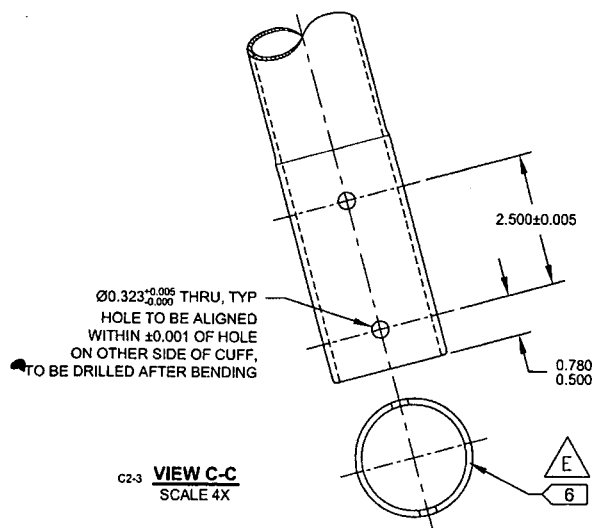
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D350-748-141
BENDING AND DRILLING DETAIL 10



SECTION B-B D3-3
SCALE 4X

w/o 60817

RELEASED
2009-10-29

DESIGN	QP	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	QP	DRAWING NO.	REV. E
MFG. APPR.	JS	D350-748-141	SHEET 3 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Sep-03-2010

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 97980

INVOICE #: 51089

**CONTRACT OR
PURCHASE ORDER #** PO12444

DESCRIPTION: SKID

QTY 1

P/N # d350-748-101

S/N # B60817

**STRESS RELIEF BAKE @ 375 DEG. BAKE HEAT CHART #10-907.
MPI INSPECTED IAW ASTM-E-1444. CADMIUM PLATED IAW AMS-
QQ-P-416C, TYP2 YELLOW, CLASS 1. BAKE HEAT CHART #10-923.**

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:



A large, stylized handwritten signature in black ink.



LIQUID PENETRANT TEST REPORT

P- 15189

CLIENT DART Aerospace DATE Sept 13-2010 PAGE 1 OF 1
ATTENTION LINDA/CHANTEL ACUREN JOB No. 108-10-0838
ADDRESS 1270 ADELPHI STREET. PO/VO No.
HAWKESBURY ON WORK LOCATION HAWKESBURY PLANT
KOH 1KT ACCEPTANCE STD. ASTM 1417 REV./DATE 2007
PROJECT F.P.I. on CROSS TUBES
ITEM(S) EXAMINED 11

JOB DESCRIPTION PROCEDURE No. LT-0002 REV./DATE TECHNIQUE No. LT-0002 REV./DATE
PART No. MATERIAL STEEL THICKNESS
SCOPE WET FLOUORESCENT LIQUID PENETRANT
INSPECTION CARRIED OUT 100% EXTERNAL.

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☐ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 16459 ☐ OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT 2LB7 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER LAB. NO
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N 1098966 CAL DUE DATE 06-7-10
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < - 4°C / 20°F ☐ - 4°C / 20°F TO 10°C / 50°F ☒ 10°C / 50°F TO 52°C / 125°F ☐ > 52°C / 125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - CROSS TUBE, W.O. 59805 ✓
1 - CROSS TUBE, W.O. 60815 ✓
1 - CROSS TUBE, W.O. 59907 ✓
1 - CROSS TUBE, W.O. 60816 ✓
1 - CROSS TUBE, W.O. 59905 ✓
1 - CROSS TUBE, W.O. 60820 ✓
1 - CROSS TUBE, W.O. 60821 ✓
1 - CROSS TUBE, W.O. 60822 ✓
1 - CROSS TUBE, W.O. 60817 ✓
1 - CROSS TUBE, W.O. 60818 ✓
1 - CROSS TUBE, W.O. 59904 ✓
1 - CROSS TUBE, W.O. 59906 ✓

- EXAMINATION WAS
COMPLETED
PRIOR TO DEFLECTION
TESTING

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Don Tillet DTR # E63387
TECHNICIAN (SIGNATURE): Mike Johnston REPORT REVIEWED BY:
NAME (PRINT): Mike Johnston NAME INITIALS
1ST TECHNICIAN 2ND TECHNICIAN
CGSB LEVEL 3 SNT LEVEL CGSB LEVEL SNT LEVEL
CGSB REG. NO 6606 CGSB REG. NO



LIQUID PENETRANT TEST REPORT

P- 15191

CLIENT DART AEROSPACE DATE SEP 13-2010 PAGE 1 OF 1
ATTENTION LINDA/CHANTEL ACUREN JOB NO. 188-10-0838 TIME AM ☒ PM ☐
ADDRESS 1270 ABELDEEN STREET PO/WO NO. -
HAWKESBURY, ON. WORK LOCATION HAWKESBURY PLANT.
KOH IK7 ACCEPTANCE STD. ASTM 1417 REV./DATE 2007
PROJECT F.P.I. ON CROSS TUBES
ITEM(S) EXAMINED 12

JOB DESCRIPTION PROCEDURE NO. LT 0002 REV./DATE - TECHNIQUE NO. LT 1417 REV./DATE -
PART NO. - MATERIAL STEEL THICKNESS -
SCOPE WET FLUORESCENT LIQUID PENETRANT
INSPECTION CARRIED OUT 100% EXTERNAL

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 16459 ☐ OUTPUT > 1000 μ W/cm² ☐ AMBIENT < 2 fc
PENETRANT 2L07 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER #20 MINIMUM DRY TIME >10 MIN. OTHER LABINO
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N 1098866 CAL DUE DATE OCT 19
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY 2010

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☒ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < - 4°C/ 20°F ☐ - 4°C/ 20°F TO 10°C/50°F ☐ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

1 - CROSS TUBE W.O. 59905 ✓
1 - CROSS TUBE W.O. 60815 ✓
1 - CROSS TUBE W.O. 59907 ✓
1 - CROSS TUBE W.O. 60816 ✓
1 - CROSS TUBE W.O. 60820 ✓
1 - CROSS TUBE W.O. 60821 ✓
1 - CROSS TUBE W.O. 60822 ✓
1 - CROSS TUBE W.O. 60817 ✓
1 - CROSS TUBE W.O. 60818 ✓
1 - CROSS TUBE W.O. 59904 ✓
1 - CROSS TUBE W.O. 59906 ✓

- EXAMINATION WAS
COMPLETED
* AFTER DEFLECTION
TESTING

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Jan & Jan Titler DTR# E6 3387
TECHNICIAN (SIGNATURE): Mike Johnston REPORT REVIEWED BY:
NAME (PRINT): Mike Johnston NAME INITIALS
CGSB LEVEL 1 SNT LEVEL 2 CGSB LEVEL 2 SNT LEVEL 2
CGSB REG. NO. 6606 CGSB REG. NO. 6606